The documentation process conversion measures necessary to comply with this revision shall be completed by 28 March 1998

INCH-POUND

MIL-PRF-19500/612A
28 December 1997
SUPERSEDING
MIL-S-19500/612
30 July 1993

PERFORMANCE SPECIFICATION SHEET
SEMICONDUCTOR DEVICE, TRANSISTOR, PNP, SILICON, POWER,
TYPE 2N7372, JAN, JANTX, JANTXV, AND JANS

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the performance requirements for PNP, silicon, power transistors for use in high-speed power switching applications. Four levels of product assurance are provided as specified in MIL-PRF-19500.

1.2 Physical dimensions. See figure 1 (TO-254AA).

1.3 Maximum ratings.

Type	P_T 1/ T_A = +25°C	P_T 2/ T_C = +25°C	V_{CBO}	V_{CEO}	V_{EBO}	I_C	I_C 3/	Reverse pulse 4/ energy	Safe operating area	T_J and T_{STG}
	W	W	V dc	V dc	V dc	A dc	A dc	mJ	See figure 4	°C
2N7372	4	58	100	80	5.5	5.0	10	15		-65 to +200

1/ Derate linearly 22.8 mW/°C for T_A > +25°C.
2/ Derate linearly 331 mW/°C for T_C > +25°C.
3/ This value applies for PW ≤ 8.3 ms, duty cycle ≤ 1 percent.
4/ This rating is based on the capability of the transistors to operate safely in the unclamped inductive load energy test circuit of figure 1.

1.4 Primary electrical characteristics.

	h_{FE2}	$\|h_{fe}\|$	$V_{BE(SAT)2}$ 1/	$V_{CE(SAT)2}$ 1/	C_{obo}	$R_{\theta JA}$	$R_{\theta JC}$
	V_{CE} = 5.0 V dc I_C = 2.5 A dc	V_{CE} = 5.0 V dc I_C = 500 mA dc f = 10 MHz	I_C = 5.0 A dc I_B = 500 mA dc	I_C = 5.0 A dc I_B = 500 mA dc	V_{CB} = 10 V dc I_E = 0 A dc f = 1 MHz		
			V dc	V dc	pF	°C/W	°C/W
Min	70	7.0	2.2	1.5	250	40	3
Max	200						

1/ Pulse (see 4.5.1)

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Defense Supply Center Columbus, ATTN: DSCC-VAT, 3990 East Broad Street, Columbus, OH 43216-5000, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 5961

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATION

DEPARTMENT OF DEFENSE

MIL-PRF-19500 - Semiconductor Devices, General Specification for.

STANDARD

MILITARY

MIL-STD-750 - Test Methods for Semiconductor Devices.

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related associated specifications or specification sheets), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Qualification. Devices furnished under this specification shall be products that are authorized by the qualifying activity for listing on the applicable qualified products list before contract award (see 4.2 and 6.3).

3.2 Associated specification. The individual item requirements shall be in accordance with MIL-PRF-19500 and as specified herein.

3.3 Abbreviations, symbols, and definitions. Abbreviations, symbols, and definitions used herein shall be as specified in MIL-PRF-19500.

3.4 Interface requirements and physical dimensions. The interface requirements and physical dimensions shall be as specified on figure 1. Methods used for electrical isolation of the terminal feedthroughs shall employ materials that contain a minimum of 90 percent AL_2O_3 (ceramic). Examples of such construction techniques are metallized ceramic eyelets or ceramic walled packages. The preferred measurements used herein are the metric units. However, this transistor was designed using inch-pound units of measurement. In case of conflicts between the metric and inch-pound units, the inch-pound units shall be ruled.

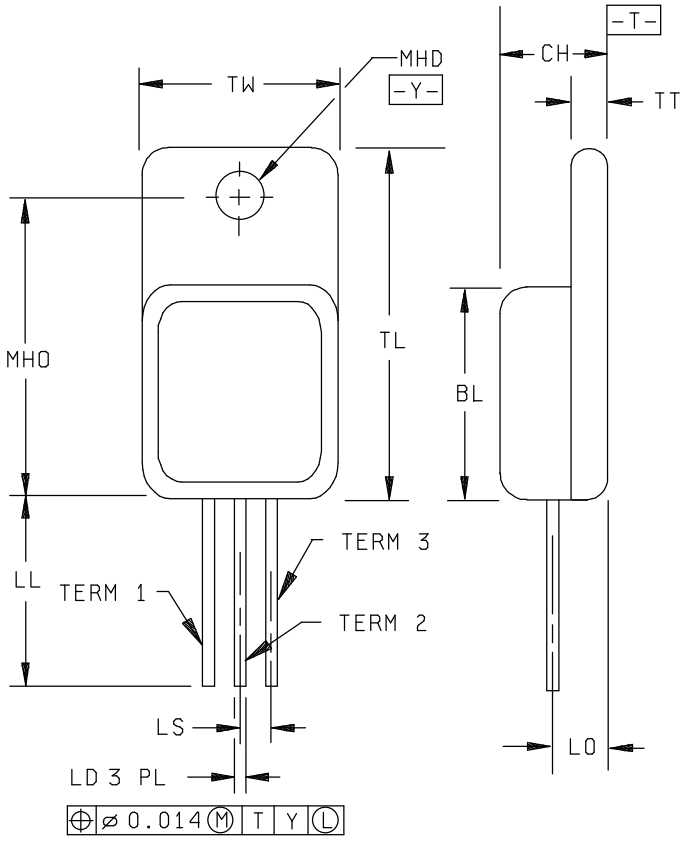
3.4.1 Lead finish and formation. Lead finish shall be solderable in accordance with MIL-STD-750, MIL-PRF-19500, and herein. Where a choice of lead finish or formation is desired, it shall be specified in the acquisition requirements (see 6.5). When lead formation is performed, as a minimum, the vendor shall perform 100 percent hermetic seal in accordance with appendix E, table IV, screen 14, of MIL-PRF-19500.

3.5 Marking. Marking shall be in accordance with MIL-PRF-19500.

3.6 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in 1.3, 1.4, and table I herein.

3.7 Electrical test requirements. The electrical test requirements shall be the subgroups specified in 4.4.2 and 4.4.3 herein.

Ltr	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
BL	.535	.545	13.59	13.89
CH	.249	.260	6.32	6.60
LD	.035	.045	0.89	1.43
LL	.53	.55	13.46	13.97
LO	.150 BSC		3.81 BSC	
LS	.150 BSC		3.81 BSC	
MHD	.139	.149	3.53	3.78
MHO	.665	.685	16.89	17.40
TL	.790	.800	20.07	20.32
TT	.040	.050	1.02	1.27
TW	.535	.545	13.59	13.89
Term 1	Base			
Term 2	Collector			
Term 3	Emitter			



NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. All terminals are isolated from case.

FIGURE 1. Dimensions and configuration (T0-254AA).

4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. Qualification inspection (see 4.2).

b. Screening (see 4.3)

c. Conformance inspection (see 4.4).

4.2 Qualification inspection. Qualification inspection shall be in accordance with MIL-PRF-19500.

4.3 Screening (JANS, JANTX, and JANTXV levels only). Screening shall be in accordance with MIL-PRF-19500 (Appendix E, table IV), and as specified herein. The following measurements shall be made in accordance with table I herein. Devices that exceed the limits of table I herein shall not be acceptable.

Screen (see appendix E, table IV of MIL-PRF-19500)	Measurement	
	JANS level	JANTX and JANTXV levels
1/	Thermal impedance (see 4.3.2)	Thermal impedance (see 4.3.2)
9	I_{CES1} and h_{FE2}	Not applicable
11	Subgroup 2 of table I herein; I_{CES1} and h_{FE2}; ΔI_{CES1} = 100 percent of initial value or 100 nA dc whichever is greater. Δh_{FE2} = ± 20 percent of initial value.	I_{CES1} and h_{FE2}
12	t = 160 hours	t = 80 hours minimum
13	Subgroups 2 and 3 of table I herein; I_{CES1} and h_{FE2}; ΔI_{CES1} = 100 percent of initial value or 100 nA dc, whichever is greater. Δh_{FE2} = ± 20 percent of initial value.	Subgroup 2 of table I herein; I_{CES1} and h_{FE2}; ΔI_{CES1} = 100 percent of initial value or 100 nA dc, whichever is greater. Δh_{FE2} = ± 20 percent of initial value.

1/ May be performed anytime before screen 9.

4.3.1 Power burn-in conditions. Power burn-in conditions are as follows:

T_J = 187.5 ± 12.5°C, $V_{CE} \geq$ 20 V dc, $T_A \leq$ 100°C

4.3.2 Thermal impedance ($Z_{\theta JX}$ measurements). The $Z_{\theta JX}$ measurements shall be performed in accordance with MIL-STD-750, method 3131. The maximum limit (not to exceed the group A, subgroup 2 limit) for $Z_{\theta JX}$ in appendix E, table IV, screening of MIL-PRF-19500 shall be derived by each vendor by means of statistical process control. When the process has exhibited control and capability, the capability data shall be used to establish the fixed screening limit. In addition to screening, once a fixed limit has been established, monitor all future sealing lots using a random five piece sample from each lot to be plotted on the applicable X, R chart. If a lot exhibits an out of control condition, the entire lot shall be removed from the line and held for Engineering evaluation and disposition.

4.3.2.1 Thermal impedance ($Z_{\theta JX}$) for measurements initial qualification or requalification. The $Z_{\theta JX}$ measurements shall be performed in accordance with MIL-STD-750, method 3131 (read and record date $Z_{\theta JX}$). $Z_{\theta JX}$ shall be supplied on one lot (500 devices minimum and a thermal response curve shall be submitted). Twenty two of these samples shall be serialized and provided to the qualifying activity for correlation prior to shipment of parts. Measurements conditions shall be in accordance with 4.4.1.

4.4 Conformance inspection. Conformance inspection shall be in accordance with MIL-PRF-19500, and as specified herein.

4.4.1 Group A inspection. Group A inspection shall be conducted in accordance with appendix E, table V of MIL-PRF-19500, and table I herein. The following test conditions shall be used for $Z_{\theta JX}$, end point measurements: $Z_{\theta JX}$ = 3.1°C/W.

a. I_M ..... 10 mA.

b. V_{CE} measurement voltage ..... 20 V (same as V_H).

c. I_H collector heating current ..... 1 A (minimum).

d. V_H collector-emitter heating voltage ..... 20 V (minimum).

e. t_H heating time ..... 100 ms.

f. t_{MD} measurement delay time ..... 50 µs to 80 µs.

g. t_{SW} sample window time ..... 10 µs (maximum).

4.4.2 Group B inspection. Group B inspection shall be conducted in accordance with the conditions specified for subgroup testing in appendix E, tables VIa (JANS) and VIb (JANTX and JANTXV) of MIL-PRF-19500. Electrical measurements (end points) shall be in accordance with the applicable steps and table I, group A, subgroup 2 herein except $Z_{\theta JX}$ shall be performed after Intermittent Life (subgroup 4) only.

4.4.2.1 Group B inspection, appendix E, table VIa (JANS) of MIL-PRF-19500.

Subgroup	Method	Condition
B3	2037	Test condition A.
B4	1037	V_{CB} = 10 V dc minimum; P_T = 2.5 W at T_A = room ambient as defined in the general requirements of 4.5 of MIL-STD-750; $t_{on} = t_{off}$ = 3 minutes minimum for 2,000 cycles. No heat sink or forced air cooling on the devices shall be permitted.
B5	1027	See 4.5.4.
B6	3131	See 4.5.2.

4.4.2.2 Group B inspection, appendix E, table VIb (JANTX and JANTXV) of MIL-PRF-19500.

Subgroup	Method	Condition
B3	1037	V_{CB} = 10 V dc minimum; P_T = 2.5 W at T_A = room ambient as defined in the general requirements of 4.5 of MIL-STD-750; $t_{on} = t_{off}$ = 3 minutes minimum for 2,000 cycles. No heat sink or forced air cooling on the devices shall be permitted.
B5	3131	See 4.5.2.

4.4.3 Group C inspection. Group C inspection shall be conducted in accordance with the conditions specified for subgroup testing in appendix E, table VII of MIL-PRF-19500. Electrical measurements (end points) shall be in accordance with the applicable steps and table I, group A, subgroup 2 herein except $Z_{\theta JX}$ shall be performed after Intermittent Life (subgroup 4) only.

4.4.3.1 Group C inspection, appendix E, table VII of MIL-PRF-19500.

Subgroup	Method	Condition
C2	2036	Tense: test condition A; weight 10 pounds ± 5 ounces; time 15 seconds. Bend strength: test condition F; bending stress 2 pounds, time 15 seconds.
C6	1037	V_{CB} = 30 V dc minimum; P_T = 2.5 W at T_A = room ambient as defined in the general requirements of (see 4.5) of MIL-STD-750; $t_{on} = t_{off}$ = 3 minutes minimum for 6,000 cycles. No heat sink or forced air cooling on the devices shall be permitted.

4.4.4 Group E inspection. Group e inspection shall be conducted in accordance with the conditions specified for subgroup testing in appendix E, table IX of MIL-PRF-19500. Electrical measurements (end points) shall be in accordance with the applicable steps and table I, group A, subgroup 2 herein except $Z_{\theta JX}$ shall not be performed.

4.4.4.1 Group E inspection, appendix E, table IX of MIL-PRF-19500.

Subgroup	Method	Condition	Sampling plan
E1	1051	500 cycles	22 devices, c = 0
E2	1039	Condition A, 500 hours	22 devices, c = 0
E3		Not applicable	
E4	3131	See 4.4.1	10 devices, c = 0

4.5 Method of inspection. Methods of inspection shall be as specified in the appropriate tables and as follows:

4.5.1 Pulse measurements. Conditions for pulse measurement shall be as specified in section 4 of MIL-STD-750.

4.5.2 Thermal resistance. Thermal resistance measurements shall be conducted in accordance with test method 3131 of MIL-STD-750. The following details shall apply:

a. Collector current magnitude during power application shall be 2 A dc.

b. Collector to emitter voltage magnitude shall be 10 V dc.

c. Reference temperature measuring point shall be the case.

d. Reference point temperature shall be 25°C ≤ T_R ≤ 75°C and recorded before the test is started.

e. Mounting arrangement shall be with heat sink to header.

f. Maximum limit of $R_{\theta JC}$ shall be 3.0°C/W.

4.5.3 Inspection conditions. Unless otherwise specified in MIL-PRF-19500 or herein, all inspections shall be conducted at a case temperature (T_C) of +25°C ± 3°C.

4.5.4 Group B accelerated life test. This test shall be conducted using one of the two options listed herein (a and b) with the following conditions applying to all options: V_{CB} = 20 V minimum dc; T_J = +275°C.

a. P_T = 2.5; P_T adjusted to give a lot average of T_J = +275°C with T_A = +125°C ± 25°C.

b. T_A = +25°C ± 3°C with P_T adjusted to give a lot average of T_J = +275°C.

TABLE I. Group A inspection.

Inspection 1/	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
Subgroup 1						
Visual and mechanical examination	2071					
Subgroup 2						
Thermal impedance	3131	See 4.4.1			3.1	°C/W
Collector to emitter breakdown voltage	3011	Bias condition D; I_C = 100 mA dc; I_B = 0; Pulsed (see. 4.5.1)	$V_{(BR)CEO}$		80	V dc
Collector to emitter cutoff current	3041	Bias condition C; V_{CE} = 60 V dc; V_{BE} = 0	I_{CES1}		1.0	µA dc
Collector to emitter cutoff current	3041	Bias condition C; V_{CE} = 100 V dc; V_{BE} = 0	I_{CES2}		1.0	mA dc
Collector to emitter cutoff current	3041	Bias condition D; V_{CE} = 40 V dc; I_B = 0	I_{CEO}		50	µA dc
Emitter to base cutoff current	3061	Bias condition D; V_{EB} = 4 dc; I_C = 0	I_{EBO1}		1.0	µA dc
Emitter to base cutoff current	3061	Bias condition D; V_{EB} = 5.5 dc; I_C = 0	I_{EBO2}		1.0	mA dc
Forward-current transfer ratio	3076	V_{CE} = 5.0 V dc; I_C = 50 mA dc; pulsed (see 4.5.1)	h_{FE1}	50		
Forward-current transfer ratio	3076	V_{CE} = 5.0 V dc; I_C = 2.5 A dc; pulsed (see 4.5.1)	h_{FE2}	70		
Forward-current transfer ratio	3076	V_{CE} = 5.0 V dc; I_C = 5.0 A dc; pulsed (see 4.5.1)	h_{FE3}	40		
Base to emitter non-saturated voltage	3066	Test condition B; V_{CE} = 5.0 V dc I_C = 2.5 A dc Pulsed (see 4.5.1)	V_{BE}		1.45	V dc
Base to emitter saturated voltage	3066	Test condition A; I_C = 2.5 A dc I_B = 250 mA dc Pulsed (see 4.5.1)	$V_{BE(SAT)1}$		1.45	V dc

See footnote at end of table.

TABLE I. Group A inspection - Continued.

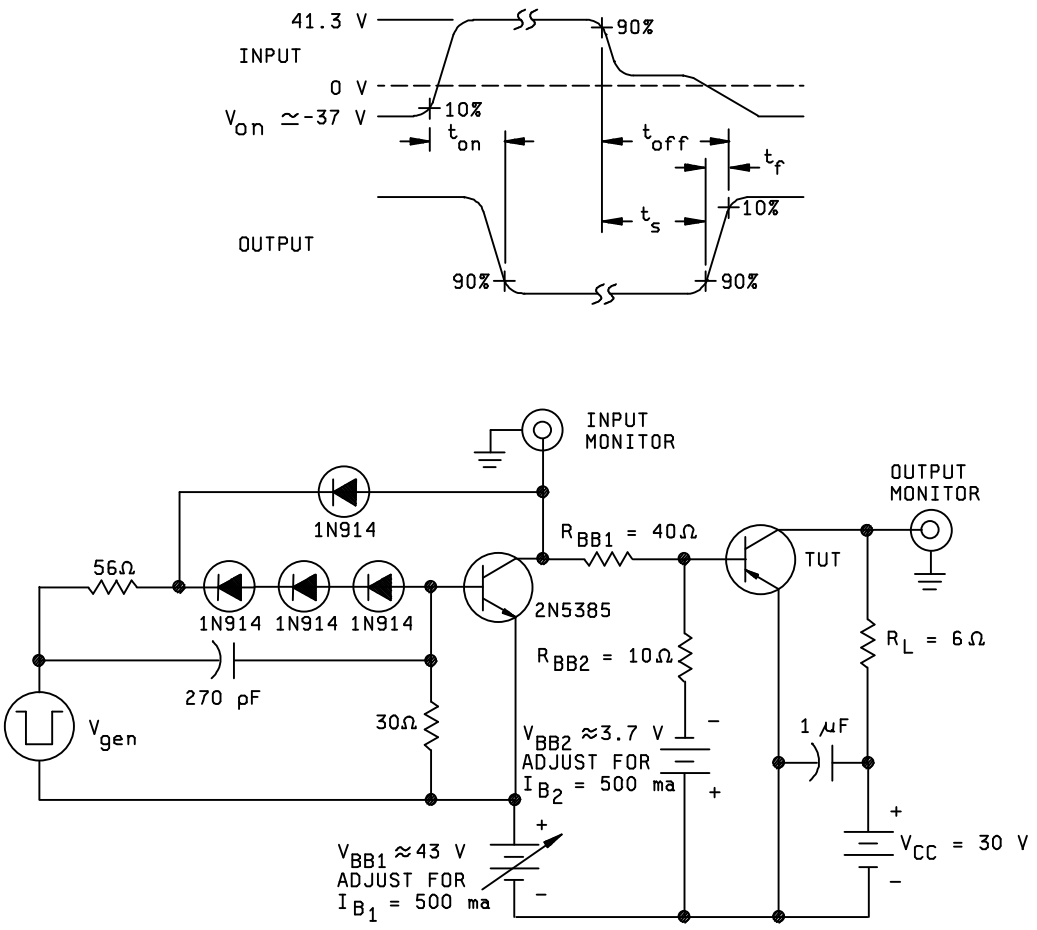
Inspection 1/	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
Subgroup 2 - Continued						
Base to emitter saturated voltage	3066	Test condition A; I_C = 5.0 A dc I_B = 500 mA dc Pulsed (see 4.5.1)	$V_{BE(SAT)2}$		2.2	V dc
Collector to emitter saturated voltage	3071	I_C = 2.5 A dc; I_B = 250 mA dc; pulsed (see 4.5.1)	$V_{CE(sat)1}$		0.75	V dc
Collector to emitter saturated voltage	3071	I_C = 5.0 A dc; I_B = 500 mA dc; pulsed (see 4.5.1)	$V_{CE(sat)2}$		1.5	V dc
Subgroup 3						
High-temperature operation:		T_A = +150°C				
Collector to emitter cutoff current	3041	Bias condition A; V_{CE} = 60 V dc $V_{BE(OFF)}$ = +2 V dc	I_{CEX}		500	µA dc
Low-temperature operation:		T_A = -55°C				
Forward-current transfer ratio	3076	V_{CE} = 5.0 V dc; I_C = 2.5 A dc; I_C = 2.5 A dc	h_{FE4}	25		
Subgroup 4						
Common-emitter, small-signal short-circuit forward-current transfer ratio	3206	V_{CE} = 5 V dc; I_C = 100 mA dc; f = 1 kHz	h_{fe}	50		
Magnitude of common emitter small-signal short-circuit forward-current transfer ratio	3206	V_{CE} = 5 V dc; I_C = 500 mA dc; f = 10 MHz	$\|h_{fe}\|$	7		
Open circuit output capacitance	3236	V_{CB} = 10 V dc; I_E = 0; 100 kHz ≤ f ≤ 1 MHz	C_{obo}		250	pF
Switching time		I_C = 5 A dc; I_{B1} = 500 mA dc	t_{on}		0.5	µs
		I_{B2} = -500 mA dc	t_s		1.4	µs
		$V_{BE(off)}$ = 3.7 V dc	t_f		0.5	µs
		R_L = 6 S; (see figure 2)	t_{off}		1.5	µs

See footnote at end of table.

TABLE I. Group A inspection - Continued.

Inspection 1/	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
Subgroup 5						
Safe operating area (continuous dc)	3055	Pre pulse condition for each test:				
		V_{CE} = 0, I_C = 0 T_C = +25°C				
		Pulse condition for each test:				
		t_p = 1 second, 1 cycle T_C = +25°C (see figure 4)				
Test 1		V_{CE} = 12 V dc, I_C = 5 A dc				
Test 2		V_{CE} = 32 V dc, I_C = 1.5 A dc				
Test 3		V_{CE} = 80 V dc, I_C = 100 mA dc				
Safe operating area (unclamped inductive)	3053	T_C = +25°C; R_{BB1} = 10 ohms; R_{BB2} = 100 ohms; L = 0.3 mH R_L = 0.1 ohms; V_{CC} = 10 V dc V_{BB1} = 10 V dc; V_{BB2} = 4 V dc I_{CM} = 10 A dc (see figure 3)				
Electrical measurements		Table I, group A, subgroup 2				
Subgroups 6 and 7						
Not applicable.						

1/ For sampling plan, see MIL-PRF 19500.



NOTES:

1. V_{gen} is -30 pulse (from 0 V) into a 50 ohm termination.
2. The V_{gen} waveform is supplied by a generator with the following characteristics: $t_r \leq 15$ ns, $t_f = 15$ ns, $Z_{OUT} = 50$ ohm, duty cycle ≤ 2 percent.
3. Waveforms are monitored on an oscilloscope with the following characteristics: $t_r \leq 15$ ns, $R_{IN} \geq 10$ MΩ, $C_{IN} \leq 11.5$ pF.
4. Resistors shall be noninductive types.
5. The dc power supplies may require additional bypassing in order to minimize ringing.

FIGURE 2. Switching time test circuit.

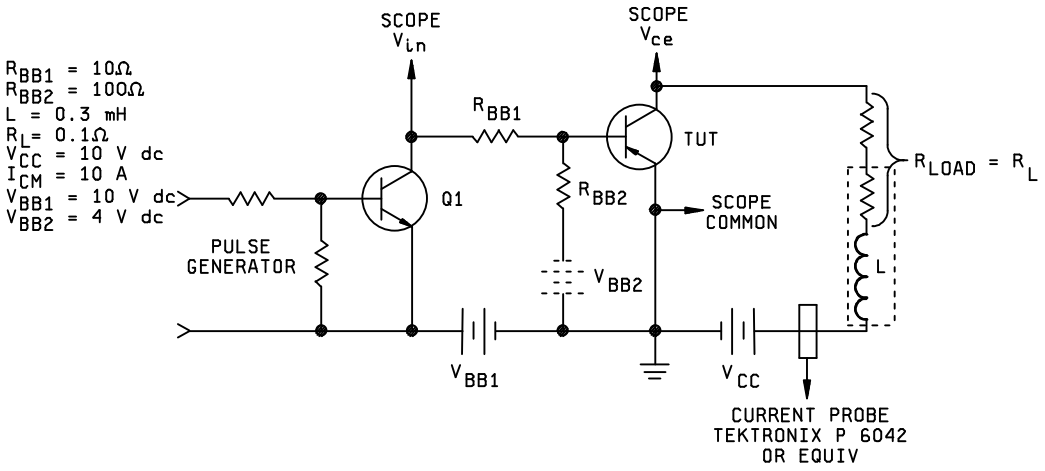


FIGURE 3. Unclamped inductive load energy test circuit.

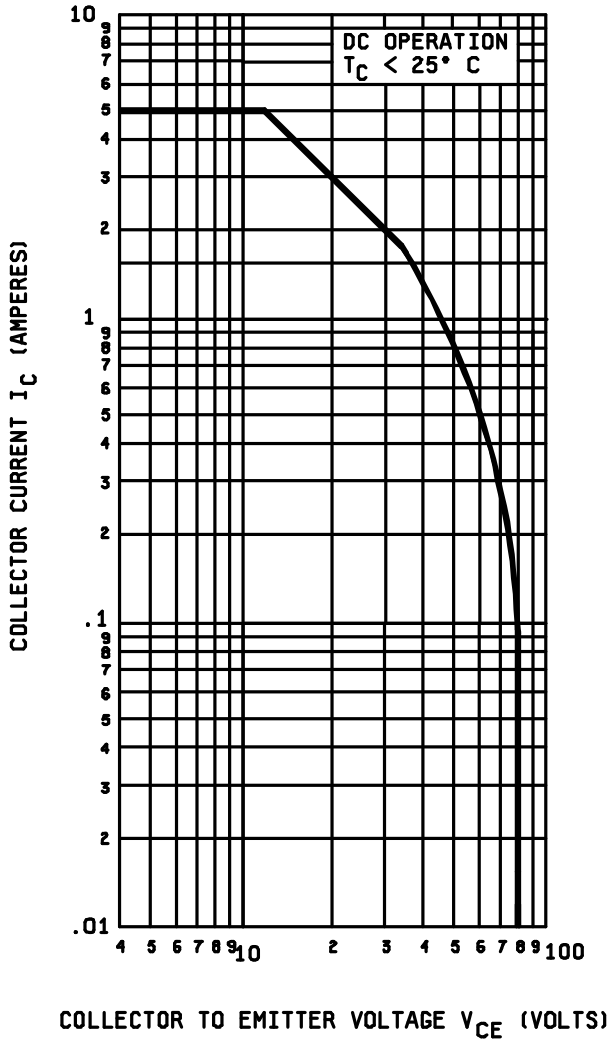


FIGURE 4. Maximum safe operating area.

5. PACKAGING

5.1 Packaging. Packaging shall prevent mechanical damage of the devices during shipping and handling and shall not be detrimental to the device. When actual packaging of material is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Points' packaging activity within the Military Department or Defense Agency, or within the Military Departments' System Command. Packaging data retrieval is available from the managing Military Departments' or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

5.2 Marking. Unless otherwise specified (see 6.2), marking shall be in accordance with MIL-STD-129.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Notes. The notes specified in MIL-PRF-19500 are applicable to this specification.

6.2 Acquisition requirements. See MIL- PRF-19500.

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Products List QPL No.19500 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from Defense Supply Center Columbus, ATTN: DSCC-VQE, 3990 East Broad Street, Columbus, OH 43216-5000.

6.4 Interchangeability information. MIL-PRF-19500/612 is a T0-254 package version of MIL-PRF-19500/535, which is a T0-210 (T0-59) package version. The military 2N7372 contains the same die as the military 2N5005. The MIL-PRF-19500/612 is preferred over the MIL-PRF-19500/535 whenever interchangeability is not a problem. For new design use 2N7372. The 2N5005 is inactive for new design.

6.5 Ordering data. Acquisition documents may specify the material and finish.

6.6 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

Custodians:
Army - CR
Navy - EC
Air Force - 17
NASA - NA

Review activities:
Army - AR, MI, SM
Navy - AS, CG, MC
Air Force - 13, 19, 85, 99

Preparing activity:
DLA - CC

(Project 5961-1902-08)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.

2. The submitter of this form must complete blocks 4, 5, 6, and 7.

3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	**1. DOCUMENT NUMBER** MIL-PRF-19500/612A	**2. DOCUMENT DATE 971228**

3. DOCUMENT TITLE
SEMICONDUCTOR DEVICE, TRANSISTOR, PNP, SILICON, POWER TYPES 2N7372 JAN, JANTX, JANTXV, AND JANS

4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, First, Middle initial)	b. ORGANIZATION	
c. ADDRESS (Include Zip Code)	d. TELEPHONE (Include Area Code) Commercial DSN FAX EMAIL	7. DATE SUBMITTED (YYMMDD)

8. PREPARING ACTIVITY

a. Point of contact Alan Barone	b. TELEPHONE Commercial 614-692-0510 DSN 850-0510 FAX 614-692-6939 EMAIL alan_barone@dscc.dla.mil
c. ADDRESS Defense Supply Center Columbus, ATTN: DSCC-VAT, 3990 East Broad Street, Columbus, OH 43216-5000	**IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:** Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340